

HEALTH EDUCATION THROUGH ICT FOR K-8: THE POINT OF SCIENCE AND COMPUTER TEACHERS VIEW ABOUT FEEL ME!

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ABSTRACT

This software is prepared within a project by pre-service teachers for K-8 students in Turkey in order to teach the subject "How do we perceive our environment" found in the scope of science in a more visual and concrete manner. The software is designed in a way that it will cover all the behavioral objectives of the subject in question and supported by multimedia which will help students to understand the abstract concepts. The aim of this study is to evaluate this software by the point of computer and science teachers' view. For this, teachers studied the software and then answered the questions asked by a survey. 10 science and 10 computer teachers, who are working in primary schools in centre of Eskişehir, involved the study.

Keywords: Health Education, Five Sense, Computers and Software.

INTRODUCTION

Information and communication technologies (ICTs) are a major factor in shaping the new global economy and producing rapid changes in society. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They have produced significant transformations in industry, agriculture, medicine, business, engineering and other fields (Unesco, 2002). ICT's not only occupy our lives but also change our way of life. The rapid change and variety especially in the information-exchange technologies in the last thirty or forty years have also influenced the issue of "information society." In this sense, technology is a very significant key-point in the change and renovation, and the changes in technology are increasingly affecting our lives (Aşkar, 2004).

The renovation in the communication technology is influential in education as in every other area. The education environment is rapidly changing with these technologies. The modernization of educational tools and equipment with these technological renovations will inevitably meet the present requirements. The need for providing education with a technological quality in such a development environment has been one of the present subjects on the agenda. Education that doesn't use the technological facilities can no longer meet today's social and individual expectations and needs (Karasar, 2004). The use of new educational technologies supported by technology helps effectively and productively to meet the increasing demand for education (Yalabık, Onay and Çağiltay, 2006).

Health Education And Technology

Health education is the continuum of learning experiences which enables people, as individuals and as members of social structures, to make informed decisions, modifies behaviors, and changes social conditions, in ways which are health enhancing. Students learn to obtain, interpret, and apply health information and services in ways that protect and promote personal, family, and community health (Michigan Department of Education, 1998; Sağlık Platformu, 2006).

Health education helps students attain health knowledge and skills that are vital to success in school and the workplace, such as setting personal health goals, resolving conflicts, solving complex problems, and communicating effectively. Research shows that effective health education also helps students do better in their other studies (Michigan State Board of Education, 2004).

Health education is the instructional program that provides the opportunity to motivate and assist all students to maintain and improve their health, prevent disease, and reduce health-related risk behaviors. It allows students to develop and demonstrate increasingly sophisticated health-related knowledge, attitudes, skills, and practices (Michigan Department of Education, 1998). For the permanency of these attitudes, skills and practices, mental construction is important. In this process things which are learned, must be concreted, because human's mental construction is from concrete towards abstract. The person nearly always learns the things that he sees and perceives as concrete easier than those as abstract. For this reason, students should be directly exposed to interactive things and objects that are found in the area of health education, and when this is impossible, students had better be provided with the model, photo or another symbol of the object or of the event. Because especially for the primary school students, the goods that they themselves see and touch make learning easier, students should be primarily taught concrete things and then eventually abstract ones. The recent developments in the technology of audio-visual tools and of computer have to a large extent helped to concretize the subjects at all levels of education (Ergün and Özdaş, 1997).

When making abstract concepts concrete in health education, the application of the subjects in the education programs facilitates learning if supplemented by interactive multimedia education softwares and educational materials. For this, the Universities of Utah and Washington have published brain atlases on CD-ROM and web, and Yale University Medical

School has published brain atlases on CD-ROM and web atlases on medical imaging (Locatis, 2002). In Turkey, Ministry of Education prepared free educational softwares and also Vitamin that is a private software company produces educational softwares for students and teachers.

Importance of Five Senses

What's that smell? Do you hear that noise? Taste this! Look at me! Feel this, is not it soft? When you hear, or even use these phrases, you probably do not stop to think about why we use them. Well, it's because of our senses. Without us even knowing, our sense organs (eyes, nose, ears, tongue, and skin) are taking in information and sending it to the brain for processing. If we didn't have them, we would not be able to smell, see, hear, taste, or touch anything! Talk about a boring life.

Our senses are the physical means by which all living things see, hear, smell, taste, and touch. Each sense provides our brains with the necessary data to work, play, and enjoy our lives, collects information about the world and detects changes within the body. Each sense and their perceptions determine our behaviours. However, all of our senses influence our state of mind. A positive sense contributes to a positive and creative state of mind (Bear, 1997). Both people and animals get all of their knowledge from their senses, and that is why our senses are so important (Education World, 2005; United Learning, 1997; Parrado, 2000)

Children may recognize the importance of their senses, but they don't often focus on them individually. With the help of educational softwares, it is possible to teach the students to identify their senses and put them to use in their life (Come to Your Senses, 2006).

FEEL ME! SOFTWARE

This software is designed as a project in the scope of the course, Design, Development and Evaluation of Educational Software, 4th grade, with the use of Macromedia Flash Professional 8.0 and is revised according to the demands and suggestions of the instructors, educational technologists, who prepared this study.

INTRODUCTION

The software is designed so as to introduce the subject "How do we perceive our environment" found in the scope of the science lesson for K-8 students in Turkey in a more visual and concrete way. With this software, it is aimed that the students learn the 9-hour subject (3-weeks) found in the education program more effectively. It is also aimed to provide the students and their parents with health education about the health of the five sense organs. The software prepared is designed so as to cover all the behavioral objectives and supplemented by multimedia that will help students to understand the abstract concepts. Furthermore, the subject will be learned more easily with the help of the exercises and tests found in the software.

With this software, students can learn the subjects whenever and wherever they want by arranging the learning time as they wish. Fell Me! Is a software which is supplemented by audio-visual elements such as pictures, figures and videos related to the subject and which helps to do as many exercises as you wish and to interact with the materials on computer without getting bored.

Home Page

When the software is set up, first you face an intro, and the subject is visualized through related animations. Following the intro is the welcome page together with the general screen-view of the software which briefly informs the user about the software. In the general screen-view of the software, a metaphor of the nature is used in order for students not to avoid real life while they are using their computers. Following the welcome page comes the main page of the software. On the home page of the software (Figure 1) is the "subjects" link through which you can pass the general subjects, the "exercises" link which includes the applications and tests that enable students to learn through interaction with the material, the "games" link related to the subject that helps them to rest when they get tired, the "about us" link that includes contact information about those who designed and revised the software, the "main page" link that allows going to the main page, the "help" link that includes information about how to use the program, the "references" link where the sources used are mentioned and the "exit" link to exit the program.

Also, there is a button that turns on and off the music used in the software and a forward button that permits going to the next page. With the help of interesting visuals related to the subject found on the main page, students are intended to focus their attention on the software. The duration of time needed to finish the subjects is found as well as what are expected for the completion of the subjects.



Figure 1: Feel Me! Home page

Objectives Page

On the “objectives” page are the behavioral objectives for the students to gain through the software. These behavioral objectives are in line with those determined by the Ministry of Education for the subjects of the science lesson for K-8 schools.

Subjects Page

The “subjects” page can be reached from the “contents” part found on the “subjects” page or from the subject visuals on the general-screen view of the software. On the “subjects” page is information about the description of the senses related to the chosen subject, the structure of the sense organs, the operation of the senses and about the health of the senses (Figure 2a).

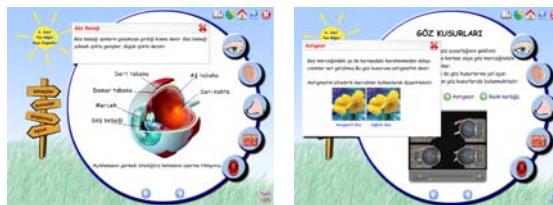


Figure 2a: Subjects page

Figure 2b: Subjects page

The subjects are introduced briefly and in a way to meet the behavioral objectives. Furthermore, the information on the pages that include the videos is presented in harmony with the videos, thus the students with hearing problems are kept in touch with the subject (Figure 2b).

For the subjects accompanied by figures, students who want detailed information are provided with this further information with the help of new windows where the explanations of the parts related to the figures are presented. Information about the health of the senses and about what should be done is given at the end of the introduction of each subject. Especially the parts related to the health of the senses are enriched for the parents of the students to benefit from the software.

Exercises Page

The “exercises” page is made up of two parts: tests on the subjects (Figure 3a) introduced and related exercises (Figure 3b). There are tests that measure the cognitive skills of students at the level of knowledge, comprehension and analysis, and exercises are found for the measurement of their cognitive skills at the level of practice.

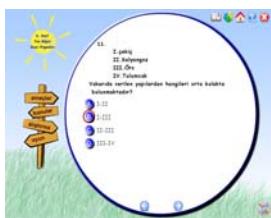


Figure 3a: Test page



Figure 3b: Exercise page

There are two tests of 20 multiple-choice questions prepared at different levels in the testing part. The first of these tests consists of questions at the level of knowledge and comprehension that cover the general subjects. The second one is more comprehensive and includes questions that require upper-level skills and more comprehension. The questions are prepared as to cover all the subjects introduced and to include equal information about each subject according to the Bloom Tucksonomy. Moreover, the answers of the questions found in the tests are equally distributed. At the end of each test is the evaluation page where the responses to the questions given by the students are shown as correct or incorrect. When the numbers of the

questions are clicked, the question re-appears, and it is possible to solve the question again. What's more, there is an access to the answers of all the questions from the evaluation page.

In the "exercises" part are the exercises that allow students to make practice on the figures related to the subjects introduced. With the help of this practice, students can learn in a more effective and interactive way.

METHOD

In order to evaluate the software of "Feel me!", a Software Evaluation Form was developed by researchers. Field experts were consulted for their views about the form developed, and the form was revised for its final version in line with their views and suggestions. A total of 32 items are included in the form which was made up of 5 parts as content, technical quality, user-friendliness, educational features and assessment/evaluation. The evaluation form and the software were given to 10 computer teachers and 10 teachers of science. The teachers were requested to rank each item in the evaluation form as from "1=Bad" to "5=Excellent."

FINDINGS

According to the findings obtained with the help of the evaluation form, the software was observed to serve the purpose in general. However, it was also revealed that there were problematic points. After overcoming the observed problematic points with the help of the views of the evaluators, it has been concluded that the software will not only help students with their lessons but also contribute to health education, which will enable their parents to raise their consciousness about the issue of health education. The views of the evaluators about the software in terms of content, technical quality, user-friendliness, educational features and assessment are as follows:

Table 1: Content

CONTENT	Field	Bad		Poor		Fair		Good		Excellent	
		f	%	f	%	f	%	f	%	f	%
Appropriateness of content to the goals, and up-dateness of content	Computer	-	-	-	-	1	%5	6	%30	3	%15
	Science	-	-	-	-	3	%15	5	%25	2	%10
Updating of content	Computer	-	-	-	-	1	%5	7	%35	2	%10
	Science	-	-	-	-	3	%15	5	%25	2	%10
Reliability of content information	Computer	-	-	-	-	-	-	9	%45	1	%5
	Science	-	-	-	-	-	-	7	%35	3	%15
Clarity and comprehensibility of content	Computer	-	-	-	-	2	%10	6	%30	2	%10
	Science	-	-	-	-	-	-	6	%30	4	%20
Ordering of content from simple to complex	Computer	-	-	-	-	1	%5	7	%35	2	%10
	Science	-	-	-	-	1	%5	7	%35	2	%10
Appropriateness of content to the development levels of students	Computer	-	-	1	%5	4	%20	3	%15	2	%10
	Science	-	-	-	-	3	%15	3	%15	4	%20
Compatibility of content with the present educational program	Computer	-	-	-	-	1	%5	6	%30	3	%15
	Science	-	-	2	%10	2	%10	3	%15	3	%15

With respect to their evaluations about content, the teachers shared the same views about the reliability of the information given, the clarity and comprehensibility of the content, and the presentation of information in order from simple to complex. On the other hand, the evaluators reported different opinions about the appropriateness of the content

to the development levels of students and about the consistency of the content with the educational program. However, with the change made by the Ministry of National Education (MNE) in 2006, the subject of the Sense Organs is handled in the scope of Learning The Life and The Living.

Table 2: User-Friendliness

USER-FRIENDLINESS	Field	Bad		Poor		Fair		Good		Excellent	
		f	%	f	%	f	%	f	%	f	%
Clarity of the directions and help related to the use of the software	Computer	-	-	-	-	-	-	8	%40	2	%10
	Science	-	-	-	-	-	-	4	%20	6	%30
Availability of reaching any activity at any time and of skipping an activity	Computer	-	-	-	-	-	-	7	%35	3	%15
	Science	-	-	-	-	-	-	6	%30	4	%20
Clarity of the functions of the menu and objects on the screen	Computer	-	-	-	-	-	-	5	%25	5	%25
	Science	-	-	-	-	-	-	5	%25	5	%25
The availability of choosing the desired size of the objects on the screen (buttons, font...)	Computer	-	-	-	-	1	%5	4	%20	5	%25
	Science	-	-	-	-	-	-	4	%20	6	%30
Easiness to surf in the software	Computer	-	-	-	-	-	-	6	%30	4	%20
	Science	-	-	-	-	-	-	3	%15	7	%35
Standards of the duties of the objects used in the software	Computer	-	-	-	-	1	%5	5	%25	4	%20
	Science	-	-	-	-	-	-	7	%35	3	%15
Easiness to understand the software screen	Computer	-	-	-	-	-	-	7	%35	3	%15
	Science	-	-	-	-	-	-	4	%20	6	%30
Functionality of the interface used in the software (all the panels, icons, windows, buttons, and menus)	Computer	-	-	-	-	1	%5	5	%25	4	%20
	Science	-	-	-	-	-	-	4	%20	6	%30
Appropriateness of the language used in the software to the age	Computer	-	-	1	%5	2	%10	5	%25	2	%10
	Science	-	-	-	-	-	-	3	%15	7	%35

According to the evaluations about the user-friendliness of the software, the teachers had similar opinions about the clarity of the directions and of help related to the use of the software, about the availability of reaching any activity at any time or of

Table 3: Technical Quality

skipping an activity and about the clarity of the functions of the objects and of the menu on the screen. On the other hand, the computer teachers have further stated that the appropriateness of the language of the software to the age of its users should be revisited.

TECHNICAL QUALITY	Field	Bad		Poor		Fair		Good		Excellent	
		f	%	f	%	f	%	f	%	f	%
Easiness of running the software	Computer	-	-	-	-	1	%5	6	%30	3	%15
	Science	-	-	-	-	-	-	8	%40	2	%10
The quality of the sounds used in the software	Computer	1	%5	1	%5	2	%10	6	%30	-	-
	Science	-	-	-	-	1	%5	8	%40	1	%5
The quality of the videos used in the software	Computer	-	-	1	%5	3	%15	4	%20	2	%10
	Science	-	-	-	-	-	-	6	%30	4	%20
The quality of the pictures and figures used in the software	Computer	-	-	-	-	1	%5	7	%35	2	%5
	Science	-	-	-	-	2	%10	4	%20	4	%20
Suitability of the colors used in the software	Computer	-	-	-	-	1	%5	6	%30	3	%15
	Science	-	-	-	-	1	%5	5	%25	4	%20
Readability of the texts used in the software	Computer	-	-	-	-	-	-	7	%35	3	%15
	Science	-	-	-	-	-	-	6	%30	4	%20
Visual clarity of the software	Computer	-	-	-	-	2	%10	4	%20	4	%25
	Science	-	-	-	-	-	-	4	%20	6	%30

In terms of their evaluations about the technical quality of the software, the teachers agreed that it is easy to run the software and that the texts are readable and the software is visually clear. The computer

teachers have also pointed out that the qualities of the sounds and videos used in the software are among the parts that need improvement.

Table 4: Educational Features

EDUCATIONAL FEATURES	Field	Bad		Poor		Fair		Good		Excellent	
		f	%	f	%	f	%	f	%	f	%
Appropriateness of the samples given in the software to the problems encountered in daily life	Computer	-	-	-	-	3	%15	5	%25	2	%10
	Science	-	-	-	-	2	%20	3	%15	5	%25
The software's enabled to student enhance critical thinking skills.	Computer	-	-	-	-	3	%15	7	%35	-	-
	Science	-	-	-	-	2	%25	5	%25	3	%15
The software's supporting various learning styles	Computer	-	-	-	-	1	%5	8	%40	1	%5
	Science	-	-	-	-	1	%5	5	%25	4	%20
The visuals' supporting student learning	Computer	-	-	-	-	1	%5	6	%30	3	%15
	Science	-	-	-	-	1	%5	3	%25	6	%30
The appropriateness of the visuals used in the software to the development levels of students	Computer	-	-	1	%5	4	%20	2	%10	3	%15
	Science	-	-	-	-	2	%10	4	%20	4	%20
Contribution of the software to discovering/creativity	Computer	-	-	-	-	2	%10	8	%40	-	-
	Science	-	-	-	-	1	%5	5	%25	4	%20

Regarding the evaluations about educational features, the teachers agreed that the samples used in the software were

appropriate to the problems encountered in daily-life, that the software supported various learning styles and that the visuals used in the

software supported student learning. Moreover, the teachers of science, as field experts, stated that these features were well-introduced in the software.

Table 5: Assessment / Evaluation

ASSESSMENT / EVALUATION	Field	Bad		Poor		Fair		Good		Excellent	
		f	%	f	%	f	%	f	%	f	%
Appropriateness of the tests used in the software to the content	Computer	-	-	-	-	-	-	7	%35	3	%15
	Science	-	-	-	-	-	-	6	%30	4	%20
Appropriateness of the exercises used in the software to the content	Computer	-	-	-	-	-	-	7	%35	3	%15
	Science	-	-	-	-	1	%5	4	%20	5	%25
Appropriateness of the evaluation questions to the goals	Computer	-	-	-	-	-	-	6	%30	4	%20
	Science	-	-	-	-	1	%5	4	%20	5	%25

With respect to the evaluations about assessment, the teachers agreed that the tests and exercises used in the software were compatible with the content and goals. This shows that different alternatives might have been presented to students for their self-assessment.

CONCLUSION

The present change in the societies today leads to the developments in the information and communication technologies. If the traditional approaches to overcoming the difficulties encountered while coping with the problems in the area of education are thought

to remain inefficient, the best approach today is to make good use of the opportunities that the information and communication technologies provide.

For health education whose goal is to help the individuals and thus the society to lead a healthy life on their own, and to develop the sense of responsibility necessary for them to have better health conditions as members of the society, it is important to make the concepts to be learnt everlasting and to maintain the continuity of the habits to be gained. This education that had better be given at lower ages should be made concrete considering the characteristic feature of the age group that learns the concrete concepts more easily than the abstract ones. One of the best tools that can be used in this process is an educational software.

The software, “Fell me!”, introduced in the study aims at presenting the subject “How do we perceive our environment” found in the scope of the science lesson for K-8 students in Turkey in a more visual and concrete way. With the software, the students are able to learn the subject whenever and wherever they want in a much shorter time and without getting bored and to maintain the continuity of what they have learnt with the help of the exercises and tests.

As a consequence of the evaluations, it could be stated that the efficiency of the software in terms of content, educational features and assessment enables students to easily learn the subjects related to five sense organs and their health with the help of this software. The user-friendliness of the software could also help adults become conscious of the sense organs and their health. Furthermore, since the software is compatible with the educational program, it could be used as a supplementary material for students. In line with the suggestions of the evaluators, the necessary changes have been done, and the software has been uploaded on the web page of www.egitimonline.org, where students and parents can reach for use.

When the importance of the health education is considered, the use of such softwares in the process of learning will ease the transmission of the subjects to be learned. In this context;

- Appropriate educational softwares should be used in the transmission of the subjects related to the health education,
- Educational environments should be arranged which will provide students with interaction when teaching the subjects related to the health education,
- Not only the students but the parents should be made conscious of the subjects related to health education as well.

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